

REMARKS

Claims 37-49 remain pending in this application. Claims 1-36 have been cancelled. Claims 37, 41-44 and 47-49 have been amended in light of the outstanding Office action. Further reconsideration of this application is requested.

Objection to Drawings

Reconsideration and withdrawal of the objection to the drawings is requested. The Office action alleges that the embodiment of the invention as claimed in claims 37 and 44 is not shown in the drawings, in that Fig. 5 shows the coolant channels running along “the entire back wall not ‘a portion’ of a back wall.” This position is in error, because claims 37 and 44 do not recite a cooling channel running “alongside ONLY a ‘portion’ of a back wall” as stated in the Office action. To the contrary, claims 37 and 44 set forth a cooling fluid channel running along at least a portion of a rear wall of a target chamber, which is in fact shown in Fig. 5.

Specifically, Fig. 5 clearly illustrates cooling fluid channel 504 running along at least a portion of rear wall 512 of target chamber 104'. The cooling fluid channel 512 running along the entire rear wall 512 meets the requirement of “at least a portion” because at least one portion of the rear wall is encompassed in the entirety of the rear wall. Put another way, any selected portion of the rear wall 512 as shown in Fig. 5 has a cooling fluid channel running alongside it. Consequently, this feature of the claimed invention is indeed shown in the drawings. Again, claims 37 and 44 do not limit the cooling channel to only a portion of the rear wall as alleged in the Office action. Therefore, this ground of objection is not well-founded and should be withdrawn.

Objection to Specification Under 35 U.S.C. § 112

The continued objection to the specification is respectfully traversed. The objection to the specification appears to be based on the Examiner's confusion regarding the discussion of a high Reynolds number flow path in paragraph 0027 and a developed flow of cooling water in paragraph 0029. First, it is pointed out that there exists no contradiction in the specification. Paragraph 0027 states simply that a high Reynolds number flow path through the two parallel channels 504 and 506 cools the horizontal

upper plate surface 514 and back wall 512, while paragraph 0029 states that the developed flow of the cooling water allows for greater heat transfer from the target assembly 10.

However, neither a high Reynolds number nor a developed flow of cooling water is set forth in the currently pending claims. The invention that one skilled in the art must be enabled to make and use under the enablement requirement of 35 U.S.C. § 112 is that defined by the claims of the application. See MPEP 2164. The claims are directed to a target assembly for containing and cooling enriched water for the production of fluorine-18. The specification is fully enabling for the claimed invention, in that one skilled in the art would be able to make and use the claimed target assembly from the specification as filed, without undue experimentation. One skilled in the art does not have to understand the theory or principles underlying heat transfer in order to make and use the claimed invention from the detailed disclosure contained in the specification. Accordingly, the objection to the specification on enablement grounds is improper and should be withdrawn.

Rejection of Claims 38, 39, 41-45, and 47-49 Under 35 U.S.C. § 112, First Paragraph

The rejection of claims 38, 39, 41-45, and 47-49 is based on the assertion that the term “substantially” as used in the claims is not used in the specification and therefore the “metes and bounds” of this term are not understood. This ground of rejection is traversed.

It is well accepted under the law that terms of degree such as “about” and “substantially” are descriptive terms commonly used in patent claims to avoid strict numerical boundaries to specified parameters and to accommodate minor variations that may be appropriate to secure the invention. See, e.g., Verve, LLC v. Crane Cams, Inc., 311 F.3d 1116, 65 USPQ2d 1051 (Fed. Cir. 2002); Ecolab, Inc. v. Envirochem, Inc., 264 F.3d 1358, 60 USPQ2d 1173 (Fed. Cir. 2001); Modine Mfg. Co. v. U.S. Int'l Trade Comm'n, 75 F.3d 1545, 37 USPQ2d 1609 (Fed. Cir. 1996); Andrew Corp. v. Gabriel Electronics, Inc., 847 F.2d 819, 6 USPQ2d 2010 (Fed. Cir. 1988).

That some claim language may not be precise does not automatically render a claim unpatentable or invalid. Instead, the question becomes whether one of ordinary skill in the art would understand what is claimed when the claim is read in light of the specification. BJ Services Co. v. Halliburton Energy Services, Inc., 338 F.3d 1368, 67 USPQ2d 1692 (Fed. Cir. 2003). Here, the terms "substantially parallel" and "fabricated substantially from tantalum," when read in light of the specification as they must be, are clearly understood by those skilled in the art to simply accommodate minor variations from the disclosed embodiments and do not seek to cover inventions of which the inventors were not in possession at the time the application was filed. Reconsideration and withdrawal of this ground of rejection is requested.

Rejection of Claims 37 and 44 Under 35 U.S.C. § 112, First Paragraph

The rejection of claims 37 and 44 as being non-enabled by the specification is respectfully traversed. The apparent basis for this ground of rejection is that the specification discloses a proton beam accelerator while the claims more broadly recite a particle accelerator.

In response, it is first pointed out that a particle accelerator is not a claimed component of the target assembly as set forth in claims 37 and 44. The particle accelerator is an inferential recitation that simply seeks to explain the function of the claimed front window of the claimed target chamber in the context of the claimed target assembly. Claims 37 and 44 are not system claims and do not require a particle accelerator in combination with a target assembly. These claims are directed solely to the structure of a target assembly as shown in Figs. 4-6 and 3. As such, the phrase "for exposing said chamber to a particle accelerator" is not necessary to define the claimed structure of the target assembly, but is provided merely for functional context. Because a particle accelerator is not a component of the claimed target assembly, "enablement for irradiation by any other type of particle beam" is simply not a relevant issue with regard to the claimed invention.

Second, the specification does not limit operation to a proton particle beam as stated in the Office action. Paragraph 0004 clearly sets forth that "[a]ccelerators are used to produce the isotopes used in PET," and provides a broad disclosure of the use of any

appropriate accelerator to produce the necessary isotopes. Those skilled in the art would understand what kinds of particle accelerators could or could not be used to produce the needed isotopes for PET, based on known parameters such as power requirements, heat capacity, etc. In fact, the Wolf et al. and Ruth et al. articles referenced in the Office action are evidence that those skilled in the art would recognize that different reaction mechanisms may be usable for production of fluorine-18, and therefore there is no reason for the claims of the present application to be limited to a proton beam accelerator. Withdrawal of this ground of rejection is respectfully urged.

35 U.S.C. § 112 Second Paragraph Rejection of Claims 37-39

The rejection of claims 37 and 44 as being indefinite is traversed. First, these claims do not contain the phrase "running alongside a portion" as alleged in the Office action. Instead, these claims accurately and definitely recite a cooling fluid channel running along at least a portion of a rear wall of a target chamber and along a portion of a top wall of the target chamber, as clearly and unambiguously disclosed and taught in Fig. 5 and paragraphs 0024 through 0030 of the specification.

Second, the meaning and scope of claims 37 and 44 is clear and unambiguous when read in light of the specification by one skilled in the art, as required when construing the meaning of the claims. Simply, the claims require a cooling channel with at least one segment such as 506 running along a portion of a top wall of a target chamber such as wall 514, and at least another segment such as channel 508 running along at least a portion of a rear wall of the target chamber such as rear wall 512, as plainly shown in Fig. 5 and understood by anyone of skill in the art. Reconsideration and withdrawal of this ground of rejection is respectfully urged.

Claims 41-43 and 47-49 have been amended to now explicitly state that the outer surface is substantially parallel to the front window, as shown in Fig. 3 by surface 212 and window 310. Withdrawal of this ground of rejection is requested.

The rejection of claims 38, 39, 41-45 and 47-49 based on use of the term "substantially" is traversed for the same reasons as discussed in detail above with respect to the written description rejection on the same purported grounds. Reconsideration and withdrawal of this ground of rejection is requested.

The additional rejection of claims 37, 38 and 44 based on the phrases "at one end" and "at another end" also are traversed on the ground that these phrases are clearly understood by those skilled in the art when reading the claims in light of the specification as required under the law of claim interpretation. The recited ends of the target body are shown in Figs. 4 and 5, which include cooling fluid inlet 404 and cooling fluid outlet 406 as shown. In the context of the specification, "end" means simply at an outside surface of the target body as disclosed in paragraph 0024, and as would be understood by anyone of skill in the art. Withdrawal of this ground of rejection is requested.

35 U.S.C. § 102 Rejection of Claims 37, 38, 40-44 and 46-49

The rejection of claims 37, 38, 40-44 and 46-49 as being anticipated by the "Admitted Prior Art" is respectfully traversed. The prior art target assembly of Figs. 1-3 is described in the specification at pages 2 and 3. As is apparent, the prior art target assembly does not contain a cooling fluid channel formed in the target body as required by the pending claims. To the contrary, the cooling channels 102, 102', 202, 204 and 302, 304 are defined and disclosed as being provided along the outside surface of the target assembly 110. See paragraph 0009. In an attempt to resolve this issue, claims 37 and 44 have been amended to more explicitly state that the cooling channels are formed within the target body, as in "inside" the target body, as shown in Fig. 5 and contrasted with the prior art channels provided along the outside surface of the target body as shown in Figs. 1 and 2. It is noted further that this amendment is consistent with the recitation of the target chamber as being formed within the target body, the meaning which the Examiner did not appear to dispute.

Additionally, the prior art target assembly does not contain a cooling channel running along at least a portion of a sloped rear wall of a target chamber as claimed. It is particularly unclear and not understood how the Examiner reads this limitation on the prior art target assembly, and the Office action provides no detail as to how such limitation could possibly be interpreted to read on the prior art assembly as disclosed in Figs. 1-3. Because the admitted prior art fails to disclose at least these limitations of independent claims 37 and 44, the admitted prior art does not anticipate any of claims

37, 38, 40-44 or 46-49. Reconsideration and withdrawal of this ground of rejection is requested.

35 U.S.C. § 102 Rejection of Claims 37-49 Over Satyamurthy et al.

The rejection of claims 37-49 over Satyamurthy et al. is respectfully traversed. Fig. 1 of Satyamurthy discloses a cooling water chamber provided behind a target chamber, with a cooling water inlet tube entering one side of the cooling water chamber and being surrounded by a concentric cooling water outlet tube. There are no cooling fluid channel conduits formed within a target body or running along top and rear walls of a target chamber as required by the pending claims of this application. Instead, there is one large cooling water chamber formed adjacent to the target chamber. There are no cooling fluid inlets or outlets at respective ends of the target body. Instead the inlet and outlet are concentrically located and formed at one end of the cooling water chamber, not the target body. Reconsideration and withdrawal of this ground of rejection is respectfully urged.


35 U.S.C. § 103 Rejections

The rejection of claims 37-49 as being obvious over any of the Admitted Prior art, Alvord, Fujiwara et al. Schlyer et al. Amini and Satyamurthy, is respectfully traversed. The Office action has failed to establish a *prima facie* case of obviousness with respect to any of the claim limitations. Instead, this ground of rejection appears to merely conclude that it would have been obvious to do what applicants have done, without showing precisely how, why or where one of ordinary skill in the art would have been led to modify each of the cited prior art references so as to result in the claimed invention. There has been established no evidentiary basis for such conclusion, nor have any detailed explanations been provided to explain precisely how and where each cited prior art reference would allegedly have been modified. As such, this ground of rejection is deficient as a matter of law and should be withdrawn. In point of fact, none of the prior art references teaches, discloses or suggests a target assembly as specifically set forth in the present claims.

Conclusion

In view of the foregoing, further and favorable reconsideration of this application, withdrawal of all outstanding grounds of rejection, and the issuance of a Notice of Allowance are earnestly solicited.

Please charge any fee or credit any overpayment pursuant to 37 CFR 1.16 or 1.17 to Deposit Account No. 14-1437.

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